

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. APPLICATION NO. 10/760,397

ATTORNEY DOCKET NO. Q79429

**AMENDMENTS TO THE DRAWINGS**

**Please replace Figures 1 and 4 of the drawings with new revised Figures 1 and 4.**

Attachment: 2 Replacement Sheets

**REMARKS**

Claims 1-10 are all the claims pending in the application.

**I. Drawings**

Figure 1 of the drawings is objected to for not designating a legend showing --Prior Art--.

Also, Figure 4 of the drawings is objected to for not designating the numerical reference #24.

Figures 1 and 4 have been revised to correct the informalities, as provided in the two accompanying replacement sheets. Accordingly, the objection to the drawings should be withdrawn.

**II. Claim Objections**

Claims 4 and 10 are objected to because of informalities. The dependency of claims 4 and 10 have been properly adjusted. Accordingly, the claim objections should be withdrawn.

**III. Claim Rejections - 35 USC § 102**

Claims 1 and 7-8 are rejected under 35 U.S.C. 102(e) as allegedly being anticipated by Fattaruso (US 6792019). Applicant respectfully traverses the 35 U.S.C. § 102 rejection. Of the rejected claims, claim 1 is the only independent claim. Claim 1 requires:

a differential amplifier for driving the semiconductor laser directly, wherein  
a semiconductor laser to be connected to the circuit is differentially driven by means of the differential amplifier,  
a first output of the differential amplifier being direct-current-coupled to a first terminal of the semiconductor laser and  
a second output of the differential amplifier being alternating-current-coupled to a second terminal of the semiconductor laser

Features of the invention include, *inter alia*, operating the amplifier in differential mode for high modulation frequencies and in single ended mode for DC current, as well as providing a DC bias for the semiconductor laser during the single ended operation, as particularly defined in claim 1.

The Examiner improperly maintains that the features, as defined in claim 1, are anticipated by Fattaruso. However, Fattaruso fails to teach or suggest the differential amplifier for driving the semiconductor laser having a first output of the differential amplifier being direct-current-coupled to a first terminal of the semiconductor laser and a second output of the differential amplifier being alternating-current-coupled to a second terminal of the semiconductor laser, as recited in claim 1. In fact, Fattaruso teaches that the laser diode 32 is AC-coupled with one output of the differential amplifier (via capacitor 44), but the second output is not coupled to the laser diode at all (Fig. 3). Instead, the differential amplifier is connected to the source voltage  $V_{cc}$  via dummy load 34 (col. 1, line 23). The Examiner seems to take the position that a closed circuit exists via dummy resistor 34 to the anode of the laser diode 32, by a DC couple (that is, connected to provide DC current). However, from a technical point of view, this position is unfeasible.  $V_{cc}$  is a fixed potential. Therefore, no current flows from dummy resistor 34 to laser diode 32. Consequently, resistor 34 cannot provide any DC couple to the laser diode 32, as recited in claim 1.

Moreover, there are inductors 40 and 42 in both emitter coupled branches of the differential amplifier, which maintain the same potential  $V_{cc}$ . The inductors 40 and 42 are mainly for DC current, while resistor 34 serves only to match the load in the two branches of the

differential amplifier at high frequencies. During high frequencies the inductors 40 and 42 are not conductive. Hence, for DC voltage, the amplifier output is shorted and therefore operates in AC mode only. For high frequencies (AC mode), the dummy resistor 34 simply serves to match the load of the left amplifier branch to the load of the series connection of resistor 30 and diode 32 of the right branch.

The Examiner, therefore, incorrectly asserts that the first output of the amplifier is DC-coupled to the laser diode 32, in Fattaruso. Indeed, this is the reason that Fattaruso needs an extra bias source 38 to bias the laser diode 32, because it cannot be biased over the AC path via dummy resistor 34 and capacitor 44. That is, the laser diode cannot be biased over a DC path, as no such DC-path exists.

In short, Fattaruso teaches to drive the laser diode in a singled-ended mode only, with the minor difference being that the laser is driven against Vcc instead of against a ground (alternatively, one could similarly set Vcc to a ground potential and use a negative supply voltage as current source 69).

Additionally, the Examiner asserts that Fig. 10 teaches a differential amplifier for driving the semiconductor laser having a first output of the differential amplifier being direct-current-coupled to a first terminal of the semiconductor laser in col. 4, lines 15-20 of Fattaruso. First, the Examiner is attempting to combine the components of two separate embodiments, as shown in Fig. 3 and Fig. 10 of Fattaruso, to teach the features of claim 1. Applicant submits that such mixing and matching of components from different embodiments is impermissible because “[t]he elements must be arranged as required by the claim.” M.P.E.P. § 2131. The teachings of

different embodiments in a single reference may not be combined absent a suggestion to do so. *In re Kramer*, 18 USPQ2d 1415, 1416 (Fed. Cir. 1991). Moreover, there is no motivation or suggestion to combine the two embodiments in the manner suggested by the Examiner (as discussed below), and the Examiner would have to engage in impermissible hindsight to state that the claims are obvious over the applied prior art. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and MPEP §2143.01.

Second, even if the two embodiments are combined as suggested by the Examiner, the modification of Fig. 3 according to the teachings of col. 4, lines 15-20 (Fig. 10) would prevent differential amplifier in Fig. 3 from being AC coupled to the laser diode. That is, col. 4, lines 15-20 teaches a configuration that is in the alternative, which means that a DC coupled laser diode configuration is used or an AC coupled laser diode configuration is used, but not both. The invention of Fattaruso is not directed toward the same differential amplifier operating in both an AC and DC coupled configuration and impliedly teaches against such a modification therein (col. 4, lines 15-20). Therefore, there is no motivation or suggestion to combine the two embodiments in the manner proposed by the Examiner, and even if combined, the proposed modification does not read on the unique features of claim 1.

For at least the foregoing reasons, independent claim 1, along with dependent claims 7 and 8, is patentable over the applied art. Therefore, the 35 U.S.C. § 102 rejection of claims 1, 7, and 8 should be withdrawn.

**IV. Claim Rejections - 35 USC § 103**

Claim 2 stands rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Fattaruso in view of Schrodinger et al. (US 2005/0025201). Claim 3 stands rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Fattaruso in view of Mukherjee (US 6226322). Claims 5-6, and 9-10 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Fattaruso in view of Giles (US 4612671).

Fattaruso is deficient vis-à-vis claim 1 as already pointed out, above. Schrodinger, Mukherjee, and Giles do not compensate for the deficiencies of Fattaruso. Even when taken for what they would have meant as a whole to the person of ordinary skill in the art, the combined teachings of Fattaruso, Schrodinger, Mukherjee, and Giles do not read on the features of independent claim 1. Therefore, claims 2, 3, 5, 6, 9, and 10 are patentable by virtue of their dependency from independent claim 1.

**V. Allowable Subject Matter**

Claim 4 is objected to as being dependent upon a rejected base claim. Applicant has herein traversed the rejection of the base claim and respectfully requests the Examiner to withdraw this objection to claim 4 and to allow it in its present form.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly invited to contact the undersigned attorney at the telephone number listed below.

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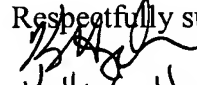
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